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EXAMINER

JOSEPH, JAISON

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/601,591

Applicant(s)

MURAKAMI ET AL.

Examiner

Jaison Joseph

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 35 – 59 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 35 –59 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 35, 5 – 7, recite the limitation “a modulation scheme such that the number of signal points of the first stream of information symbols is four or more on a signal constellation defined by said modulation scheme”. However present specification does not disclose a modulation scheme that has the number of signal points is four or more on a signal constellation defined by said modulation scheme. Examiner is not understood how the additional four or more constellation points are defined in the modulation scheme. Present specification does not show a modulation scheme that has four or more constellation points than a specified modulation scheme (see figures 5 - 8). Furthermore, present specification

discloses, "the invention is applicable to any more-than-7-signal-point modulation scheme" (see page 7, lines 24 – 27). Which clearly states that the invention is only applicable to a modulation scheme that has more than 7 signal points. Clarification is required.

Similar scenarios exist in claim 45, 58 and 59.

Claims 36 – 44, 46 – 57 are inherently rejected as being depended on above rejected claims.

Claims 56 and 57 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 56, line 6 recite the limitation "...an estimating unit that is configured to estimate, by said pilot signal a frequency offset between the transmitter and the receiver...". However present specification does not disclose or suggest having a frequency offset estimating means. Furthermore present specification does not even disclose or suggest correcting or compensating a frequency offset between the transmitter and the receiver. In contrary, present specification discloses a phase offset compensation unit to compensate the phase offset in the received signal (see figure 2, component 120 phase error estimator and phase and amplitude compensator 140). Therefore claim 56 contains subject matter, which was not described in the specification in such a way to enable one skilled in the art which pertains or with which it is most nearly connected, to make and/or use the invention. For the purpose of following art

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rejection, Examiner interpret " frequency offset" as "phase offset" as described in the specification.

Similar scenario exists in claim 57. Clarification is required.

Claim Objections

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 51 been renumbered 52. Present application numbered two different claims as claim 51. Therefore, Examiner is renumbering the second of claim 51 as claim 52.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 35, 37, 39, 45, 47, 49, 58 and 59 are rejected under 35 U.S.C. 102(b) as being anticipated by Jasper et al. (US Patent 5,381,449).

Regarding claim 35, Jasper et al teach a method of transmitting a digital data stream in a digital wireless communications system, the method comprising the steps of: converting said digital data stream into a first stream of information symbols through a modulation scheme such that the number of signal points of the first stream of the information symbols is four or more on a signal constellation defined by said modulation scheme (see figure 5A and figure 6, and column 6, line 23 – column 7, line 25); generating a pilot symbol of which a signal point on the signal constellation has an amplitude larger than amplitudes of possible signal points of the first stream on said signal constellation and differs in phase from a particular signal point of the first stream having a maximum possible amplitude among the signal points of the first stream of the information symbols on said signal constellation (see figure 6, elements 84,,86, and 88 and column 6, line 59 – column 7, line 25); inserting said pilot symbol regularly in said first stream of said information symbols to generate a second symbol stream (see figure 5A components 107 –110); and transmitting a modulated version of said second symbol stream by wireless (see figure 5A).

Regarding claim 37, which inherits the limitations of claim 35, Jasper et al further teach wherein said modulation scheme is a quadrature amplitude modulation (see figure 6).

Regarding claim 39, which inherits the limitations of claim 37, Jasper et al further teach wherein said pilot symbol is disposed on either an in-phase axis or a quadrature-phase axis in said constellation (see figure 6, component 84).

Regarding claim 45, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 35 is applicable hereto.

Regarding claim 47, which inherits the limitations of claim 45, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 37 is applicable hereto.

Regarding claim 49, which inherits the limitations of claim 47, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 39 is applicable hereto.

Regarding claim 58, Jasper et al teach a method of transmitting a digital data stream in a digital wireless communications system, the method comprising the steps of: converting said digital data stream into a first stream of information symbols through a modulation scheme such that the number of signal points of the first stream of the information symbols is four or more on a signal constellation defined by said modulation scheme (see figure 5A and figure 6, and column 6, line 23 – column 7, line 25); generating a pilot symbol of which a signal point on the signal constellation has an amplitude larger than amplitudes of possible signal points of the first stream on said signal constellation (see figure 6, elements 84,,86, and 88 and column 6, line 59 – column 7, line 25), wherein said pilot symbol is disposed on either an in-phase axis or a quadrature-phase axis in said signal constellation (see figure 6, component 84); inserting said pilot symbol regularly in said first stream of said information symbols to generate a second symbol stream (see figure 5A components 107 –110); and

transmitting a modulated version of said second symbol stream by wireless (see figure 5A).

Regarding claim 59, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 58 is applicable hereto.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 36, 38, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jasper et al. (US Patent 5,381,449).

Regarding claim 36, which inherits the limitations of claim 35, Jasper et al do not expressly disclose generating a pilot symbol includes the step of setting the amplitude of the pilot symbol not larger than 1.6 times the maximum possible amplitude. However the pilot signals of Jasper et al are greater than the maximum possible amplitude of the information signal and could have a limitation such as 1.6 times maximum possible amplitude of the information signal since applicant does not disclose setting the amplitude to 1.6 times the information signal provides an advantage, is used for a particular purpose, or solves a stated problem. There fore it would have been obvious to an ordinary skilled in the art at the time the invention was made to have the pilot symbol not larger than 1.6 times a maximum possible amplitude of said information symbols.

Regarding claim 38, which inherits the limitations of claim 36, Jasper et al further teach wherein said modulation scheme is a quadrature amplitude modulation (see figure 6).

Regarding claim 40, which inherits the limitations of claim 38, Jasper et al further teach wherein said pilot symbol is disposed on either an in-phase axis or a quadrature-phase axis in said constellation (see figure 6, component 84).

Regarding claim 46, which inherits the limitations of claim 45, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 36 is applicable hereto.

Regarding claim 48, which inherits the limitations of claim 46, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 38 is applicable hereto.

Regarding claim 50, which inherits the limitations of claim 48, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 40 is applicable hereto.

Claims 41 – 44 and 41 – 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jasper et al. (US Patent 5,381,449) in view of Wright (US Patent 5,809,083).

Regarding claim 41, which inherits the limitations of claim 35, Jasper et al do not expressly teach the modulation scheme is quadrature phase shift keying. However in analogous art Wright teaches PSK modulation (see column 5, lines 5 – 33). Therefore it

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would be obvious to an ordinary skilled in the art at the time the invention was made to use PSK modulation. The motivation or suggestion to do so is to comply with a communication standard.

Regarding claim 42, which inherits the limitations of claim 41, Jasper in view of Wright do not expressly disclose generating a pilot symbol includes the step of setting the amplitude of the pilot symbol not larger than 1.6 times the maximum possible amplitude. However the pilot signals of Jasper et al in view of Wright are greater than the maximum possible amplitude of the information signal and could have a limitation such as 1.6 times maximum possible amplitude of the information signal since applicant does not disclose setting the amplitude to 1.6 times the information signal provides an advantage, is used for a particular purpose, or solves a stated problem. There fore it would have been obvious to an ordinary skilled in the art at the time the invention was made to have the pilot symbol not larger than 1.6 times a maximum possible amplitude of said information symbols.

Regarding claim 43, which inherits the limitations of claim 41, Jasper et al further teach wherein said pilot symbol is disposed on either an in-phase axis or a quadrature-phase axis in said constellation (see figure 6, component 84).

Regarding claim 44, which inherits the limitations of claim 42, Jasper et al further teach wherein said pilot symbol is disposed on either an in-phase axis or a quadrature-phase axis in said constellation (see figure 6, component 84).

Regarding claim 51, which inherits the limitations of claim 45, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 41 is applicable hereto.

Regarding claim 52, which inherits the limitations of claim 51, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 42 is applicable hereto.

Regarding claim 53, which inherits the limitations of claim 51, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 43 is applicable hereto.

Regarding claim 54, which inherits the limitations of claim 52, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 44 is applicable hereto.

Regarding claim 55, Wright further teach a receiver that is configured to receive said second symbol stream from said modulated version of said second symbol stream (see figure 5, the receiver 500); an estimating unit that is configured to estimate, by said pilot signal, an amplitude distortion of information symbols between said pilot signal and a next pilot symbol in said second symbol stream (see figure 5, components 518, 520, 530 and see column 9, lines 19 – column 11, line 30); a removing unit that is configured to remove said amplitude distortion from said information symbols following said pilot symbol in said second symbol stream by using said estimated amplitude distortion to obtain amplitude-distortion-compensated information symbols (see figure 5 component 522 and see column 9, lines 19 – column 11, line 30); and a deciding unit that is

configured to decide a digital symbol associated with each of said obtained amplitude-distortion-compensated information symbols according to said signal constellation (see figure 5, component 524 and see column 9, lines 19 – column 11, line 30).

Regarding claim 56, Wright et al further teach a receiver that is configured to receive said second symbol stream from said modulated version of said second symbol stream (see figure 5, the receiver 500); an estimating unit that is configured to estimate, by said pilot signal, a phase offset between the transmitter and the receiver (see figure 5, components 518, 520, 530 and see column 9, lines 19 – column 11, line 30); a removing unit that is configured to remove phase offset from said information symbols following said pilot symbol in said second symbol stream by using said estimated phase offset to obtain phase-offset-compensated information symbols (see figure 5 component 522 and see column 9, lines 19 – column 11, line 30); and a deciding unit that is configured to decide a digital symbol associated with each of said obtained phase-offset-compensated information symbols according to said signal constellation (see figure 5, component 524 and see column 9, lines 19 – column 11, line 30).

Regarding claim 57, which inherits the limitations of claim 55, the claimed transmitter including the features correspond to subject matter mentioned in above rejection of claim 56 is applicable hereto.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaison Joseph whose telephone number is (571) 272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaison Joseph
05/21/2007


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER